

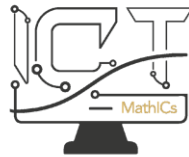
NEWSLETTER

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Dissemination Committee



MathICs e-NEWSLETTER #4

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1. News from MathICs project

After the third newsletter, the MathICs project team didn't stop and in the next months worked very hard to achieve all the milestones and deliverables of the project timeline.

In December 2022 we had our 3rd consortium meeting in École Centrale de Nantes.

The project development was already almost finish, the trainings of WP3 and WP4 were completed in January 2023, and there are some activities from each work package that is important to notice:

WP1: École Mines completed in February 2023 the **video room** installations, and in the other Partners we are managing the installation of the rest of the equipment. The equipment acquired under this project is installed and being used by the respective teachers and/or researchers in the partner Moroccan Universities.

WP2: the MathICs project team opened online registration for the training programme on "the use of ICT in mathematics teaching" for the 2nd training part of the MathICs project. This training takes place at the FSR of the University Mohammed V of Rabat (UM5R), in collaboration with the Rabat School of Mines (ENSMR), the University of Almería (Spain), the Ecole Centrale de Nantes (France).

WP3: IST Lisbon delivered the second training session from November 2022 to January 2023.

WP4: Between October and November 2022, Centrale Nantes delivered the 2nd training in the partner institutions of Beni Mellal and Marrakech, and in June 2022 in Kenitra.

WP5: After the WP1, WP2, WP3 and WP4 trainings, trainees are ready to implement what they have learnt and are starting to record their own videos to use in their classes in December 2022, opening the WP5 preparation.

WPDE: The project coordinators, Prof. Luis Oyonarte Alcala from UAL and Prof. Driss Bennis from UM5R participated in several events during the last months, along with other colleagues from MathICs such as Prof.^a Hanaa Hachimi (USMS), Prof. Fahid Brahim (UIT) and Prof. Jose Carmona Tapia (UAL), where they disseminated the outcomes of MathICs.

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2. Follow up of Training Sessions

2.1.1 Follow up: WP2 and WP4 MathICs Training in Rabat (June-July 2023, WP2-UAL and WP4- ECN)

Our second training period was held from 27th June to 1st July 2022, at University Mohamed V of Rabat in collaboration with Rabat School of Mines.



This training will increase the impact of our project in a wonderful waterfall effect: our recently trained Moroccan professors, together with our European experts, will be reaching even more Moroccan professors and PhD students, who will be training future mathematic teachers in Morocco!



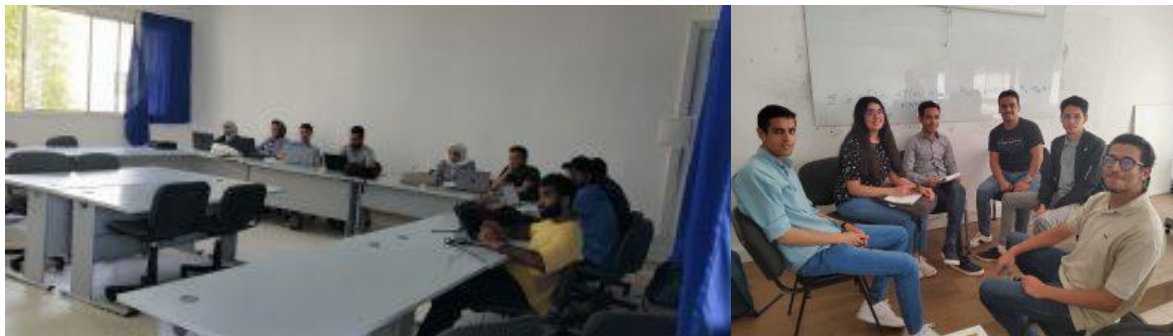
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The second training period in our project has started at University Mohammed V of Rabat and Rabat School of Mines (ENSMR).

The thematic areas are Learning Theories with Prof. Fouad Bennis (ECN), Sagemath with Prof. Juan Ramón García Rozas, R Software with Prof. Fernando Reche Lorite and Geogebra with Prof. José Carmona Tapia.

The general program was as follows, where pedagogical approach happened in the morning and software training in the afternoon.

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MONDAY, JUNE 27

PEDAGOGICAL APPROACH (Université Mohammed V de Rabat)	
9:30 - 10:45	Learning Theories I
10:45 - 11:15	Coffee break
11:15 - 12:30	Learning Theories II

SOFTWARE (École Supérieure des Mines de Rabat)			
	SageMath	GeoGebra	R
14:30 - 15:45	Lists, Tuples, Sets & Dictionaries	Introduction & General Overview	Data Structures
15:45 - 16:15	Coffee break		
16:15 - 17:30	Programming I	Dynamic Text Messages	Importing Data

TUESDAY, JUNE 28

PEDAGOGICAL APPROACH (Université Mohammed V de Rabat)	
14:30 - 15:45	Workshop on Learning Theories
15:45 - 16:15	Coffee break
16:15 - 17:30	Workshop on Learning Theories

SOFTWARE (École Supérieure des Mines de Rabat)			
	SageMath	GeoGebra	R
9:30 - 10:45	Programming II	Using Conditionals	Basic Operation I
10:45 - 11:15	Coffee break		
11:15 - 12:30	Programming III	Using Sliders	Basic Operation II

WEDNESDAY, JUNE 29

PEDAGOGICAL APPROACH (Université Mohammed V de Rabat)	
14:30 - 15:45	Instructional Design
15:45 - 16:15	Coffee break
16:15 - 17:30	Instructional Design

SOFTWARE (École Supérieure des Mines de Rabat)			
	SageMath	GeoGebra	R
9:30 - 10:45	Arithmetic & Number Theory I	Creating Animations	Building Procedures
10:45 - 11:15	Coffee break		
11:15 - 12:30	Arithmetic & Number Theory II	Activity Menus I	Graphics I

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THURSDAY, JUNE 30			
SOFTWARE (Université Mohammed V de Rabat)			
	SageMath	GeoGebra	R
9:30 - 10:45	Functions & Calculus	Activity Menus II	Graphics II
10:45 - 11:15	Coffee break		
11:15 - 12:30	Graphics	Randomized Questions I	Graphics III

PEDAGOGICAL APPROACH (École Supérieure des Mines de Rabat)	
14:30 - 15:45	Workshop on Instructional Design
15:45 - 16:15	Coffee break
16:15 - 17:30	Workshop on Instructional Design

FRIDAY, JULY 1			
SOFTWARE (Université Mohammed V de Rabat)			
	SageMath	GeoGebra	R
9:30 - 10:45	Matrices & Vectors	Randomized Questions II	R Commander I
10:45 - 11:15	Coffee break		
11:15 - 12:30	Equation Solving	Developing New Tools	R Commander II

PEDAGOGICAL APPROACH (École Supérieure des Mines de Rabat)	
14:30 - 15:45	e-learning Design
15:45 - 16:15	Coffee break
16:15 - 17:30	e-learning Design



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The objectives of the second round of trainings for WP2 and WP4 are achieved; we counted with the presence of a great team, where students have enjoyed learning and gaining new knowledge and practical techniques to implement in their classrooms.

During the second training period, Moroccan professors who followed the first training in Europe have assisted the European professors. The former trainees have actively participated in the courses, developing a large amount of activities and presenting them in a participative way to the rest of their colleagues.

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2.1.2 Follow up: WP2 and WP4 Training in Kenitra/Marrakech/Beni Mellal (October and November 2022, WP2- UAL and WP4- ECN)

Online registration for the training program on the use of ICTs in mathematics education were opened for the 2nd WP4 training sessions and they took place in:

- October 2022: Kenitra, Marrakech (Morocco)
- November 2022: Béni Mellal (Morocco)

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The program "Training on pedagogical methods for teaching Mathematics using ICTs" was led by ECA, Prof. Fouad Bennis from Centrale Nantes, France, and the "Learning Theories" with Prof. Fouad Bennis (ECN), Sagemath with Prof. Luis Oyonarte, R Software with Prof. Fernando Reche Lorite and Geogebra with Prof. José Carmona Tapia.



2.2 Follow up: WP3 Training in Kenitra/Rabat/Marrakech/Beni Mellal (November/December 2022 and January 2023, WP3- IST)

Prof. Ana Moura Santos from IST Lisbon instructed the second part of the WP3 training. The training sessions were dedicated to the creation of audio-visual content and others for MOOCs.

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The sessions took place at the partner universities' premises, in order to provide individualised support for students to put into practice the contents they had already acquired in previous sessions:



- November 2022, Rabat, Kenitra, Béni Mellal and Marrakech (Morocco)
- January 2023: 2nd training in Marrakech (Morocco)

These sessions had a particular focus on the creation of short videos on topics related to Mathematics in the university curriculum. The trainees were mostly constituted by young PhD students who also work as TAs. The recording moment in the local studio of the storyboard and script, carefully prepared since day one, were always the highlight of these sessions, as it allows a real experience on how to face a camera, with a good preparation for it.

This training was free and open to professors and Phd Students.

In the last part of our training, participants made videos to use in the classroom and teach math in a different way. The resulting video recordings look very close to videos made available on well-known MOOC platforms such as edX or Coursera.

It's amazing what you can do to teach, motivate your students (and get them involved, even if they're far away!) thanks to ICT: <https://youtu.be/ypfJlXoDBiU>

2.3 WP5: preparation of Mentoring Sessions

In December 2022, Prof. Driss Bennis and Prof. Luis Oyonarte Alcalá (coordinators of MathICs) and Prof. Brahim Fahid (UIT Kenitra) organized a meeting with the participants of the MathICs trainings to explain in more detail the application phase of MathICs as well as to answer questions from the participants.

Participants will produce videos with mathematical content by following the recommendations and instructions learned during the first three MathICs training sessions.

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3. Follow up: Equipment installation

In 2022, the equipment such as video camera, computer, sound equipment was installed in the Partner universities:

- Rabat (École Nationale Supérieure des Mines de Rabat)
- Beni Mellal



Because of some bureaucratic problems with the invitation for the purchase of equipment, the rest of the Partners will have the installation in 2023

- Kenitra
- Rabat
- Marrakesh

4. Current activities

- ❖ December 2022, Nantes: PMB and consortium meeting

Project Management Board, Steering Committee, WP Quality, WP Dissemination teams were at École Central de Nantes, between 13th and 16th December 2022 for the annual project meetings.

We started planning our MathICs caravan and WP5: the application of the training in the design of attractive math courses based on what our trainees learnt.

All the WP Team Leaders presented the results and achievements of each WP, and between partners we all could find some solutions to some issues noted.

Well trained professors, and a network of lifetime connections, achieving the multiplier effect.

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❖ **May 2023: 4th Consortium Meeting**

We had a week of meetings for the Strengthening Mathematics Education - MathICs project in Universidad de Almería, with Dissemination, Quality and PMB meetings.



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The presentation of the interim external quality evaluation report was also very appreciated and returns with good results from our students/teachers.

The project coordinator Luis Oyonarte, from the Mathematics Department at the University of Almería, who was very pleased both with the meeting on campus and with the progress of a project that was very well received: "For example, the training programme was expected to involve 70 people in total, the European Union asked us to make a small effort and double the courses with the same budget, more than doubling it". In fact, "the introduction of ICTs in mathematics training was a priority in Morocco, and when the project was presented, on my first trip to the country, the ministry asked me to explain it to the Secretary General of the Universities", revealed Oyonarte .

Very importantly, "the training programme has been developed in such a way that the last part is given by those who received it in the first instance". The meaning is to consolidate: "We give the first courses, but the final application is theirs, since they address the following students and this supposes the sustainability of the result of the project in the long term, in the future, going much further . beyond its completion." Therefore, "it is having quite a big impact", so the only possible evaluation is total satisfaction. Luis Oyonarte recalled that the two "pillars are the purchase of material for the development of the online classes and the recording of the digital content, one part almost finished, and the other is the creation of a complete training programme.

5. Dissemination events:

- ❖ March 2022: Dissemination event to the profit of PhD students (Rabat)
- ❖ May 2022: Journée Pédagogique dédiée à la mémoire du Professeur Ali Boutoulout by Prof. Najib Khalid (UMI -Meknes)



- ❖ October 2022: Erasmus Scientific Day 2022
These days will take place on 17 and 18 October 2022 in Marrakech, face-to-face and online under the theme "Cooperation and research for Higher Education and Innovation".

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This international conference is open to scholars, practitioners and Erasmus projects, to present their research results or case studies in the following 4 topics of the Conference:

- Education, training (pedagogical innovation, curricula dev, COVID impact, etc.) and labour skills.
- Academic mobility of students and staff in higher education
- Internationalization
- Inclusion / People with few opportunities in higher education

MathICs project was represented by Prof.^a Ibtissam Benmiloud and Prof.^a Maria Lebbar.



- ❖ October 2022: Presentation in Rabat Learning Center (Rabat)
- ❖ November 2022: Journée d'astronomie et mathématiques (Tifelt) MathICs project was represented by Prof. Najib Khalid.



- ❖ February 2023: participation in International Congress of Numerical Analysis and Optimization (JANO14)

The 14th edition of JANO, held from 20th to 22nd February 2023 at Rabat Mines School was an opportunity to discuss a number of research topics on recent developments in Applied Mathematics.

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The main goal of this scientific meeting is to bring together researchers from different fields of Applied Mathematics, and more particularly researchers working in the field of numerical analysis, optimization, scientific computation, and the growing research domains of Data Science and Artificial Intelligence. The conference offers the possibility to develop new ideas and collaborations and to be aware of the latest search trends in numerical and optimization techniques and their applications in various fields.



The organizing committee of the JANO14 conference was pleased to dedicate the afternoon of February 21, 2023, to a special session on Science, Technology, Engineering, and Mathematics Education (STEM). This half-day of reflection was an opportunity to discuss trend themes of interest to professors and policymakers around a panel discussion and with the presence of specialists:

- Dr. Luis Oyonarte Alcalá; University of Almeria & Dr. Driss Bennis; University Mohammed V in Rabat (MathICs project coordinators): Experience of the MathICs project.
- Dr. Fouad Bennis; Ecole Centrale de Nantes (Actor of the MathICs project): The importance of pedagogical approaches in distance learning.
- Dr. Abdelkrim El Marrakchi; Ministry of Education (Président de l'association ATDTec): Contribution of pedagogical robotics in STEM education.
- Dr. Khalid Berrada; University Mohammed V in Rabat: OER, Open licensing and Open Science.
- Dr. Naceur Achtaich; University Hassan II in Casablanca (Founder of ABC MathInfo Association): Popularization of mathematics and the science caravan experiment.
- Dr. Khalid Najib: session moderator

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- ❖ May 2023: Presentation in International Staff Week 2023 at University of Almeria by Luis Oyonarte (UAL).

6. Thesis Défense's with MathICs project example:

❖ July 2022: Prof. Driss Bennis and Prof. Luis Oyonarte Alcala have been a members in the jury of defence of Master thesis on the training on ICTs, in Kenitra.

❖ February 2023: Brahim Fahid was an adviser on Master Thesis- "La formation continue aux TICE en enseignement supérieur des mathématiques" in Kenitra.

7. MathICs Caravan :

MathICs is an Erasmus+ Capacity Building Project with the aim of strengthening mathematics education by the use of ICTs in Morocco. So far, we have organized trainings in our partner Universities, and they were quite successful. The participants have designed hybrid lessons that are being assessed by our experts

In 2023 are going on a tour to show you what we did, but not only to present it to other Students, Professors, Pedagogic Techniques and other's, also to put some into practice through short workshops. For more information or to follow our route, please check our website:
<https://www2.ual.es/MathICs/mathics-caravan/>

MathICs Caravan is starting to move and will be to:

- education departments, high schools, universitie
- inspectors, educators, students

These videos are available on our YouTube channel project.

The presentation of the entire classes is available on the MathICs applications site:

<https://sites.google.com/.../mathics.../lycee-college/>

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PROJET ERASMUS+ ACTION CLÉ 2 - RENFORCEMENT DES CAPACITÉS DANS L'ENSEIGNEMENT SUPÉRIEUR (2021-2024)

Caravane de MathICs

Sur l'utilisation des TIC dans l'enseignement des mathématiques

Avril 2023

WHAT ARE MATHICS CARAVANS?

The Dissemination Team is bringing a short version of MathICs training to the widest audience possible in Moroccan educational institutions. We will reach teachers, teacher trainers, students and inspectors in order to show them and/or practice with them how to apply ICTs in the teaching of mathematics.

- MIDDLE SCHOOLS & HIGHSCHOOLS**
 - Hybrid course experience: meeting teachers, programming complete hybrid sessions with them.
 - Use of software and hardware: providing some tips on the use of software and hardware in this context.
- HIGHER EDUCATION INSTITUTIONS**
 - Depending on the target audience we will develop the following workshops:
 - The role of ICT in Education
 - Educational video production
 - E-assessment/NET based assessment
- 2.1 DIRECTORATES**
 - Representing the Ministry of Education as a local level
- 2.2 TEACHER TRAINING CENTERS**
 - Leading to a professional graduate certificate in education
- 2.3 PRIVATE ENGINEERING SCHOOLS**
- 2.4 UNIVERSITIES**
 - Higher Schools of Education and Training
 - Faculties of Sciences
 - Polydisciplinary Faculties

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And the first two stops in higher institutions are:

- April at Kenitra
- April at Tamsna
- May at CRMEF Safi : Centre régional des métiers d'éducation et de formation, Annexe Safi
- May at CRMEF Marrakech : Centre régional des métiers d'éducation et de formation, Marrakech

And follow us for more updates!

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8. Upcoming events and dates

- ❖ October 05-06, 2023: MathICs presentation in the 9th Edition of the International Conference on Optimization and Applications - ICOA2023: Prof. Dr. Hanaa Hachimi (IEEE Senior Member)



- ❖ April- December 2023: MathICs Caravan

List of MathICs Caravan (to be confirmed)

- June- Casablanca, Fés, Oujda
- September- Rabat, Tanger, Larache
- October- Kenitra
- November- Kenitra, Tanger
- October/November- Tifelt, Meknés
- January 2024- Khémisset, Rabat
- February 2024- Tamesna
- March 2024- Kenitra
- April 2024- Rabat
- May 2024- Beni Mellal

- ❖ Next Dissemination Events (to be confirmed):

Marrakesh (October 2023)

- ❖ Next Project meetings (to be confirmed):

October 2023: PMB meeting in Marrakech, Morocco

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